ACE BASIN
NATIONAL ESTUARINE
RESEARCH RESERVE

MODELING TIDAL HEADWATER RUNOFF IN COASTAL SOUTH CAROLINA

Rain gauges placed in watersheds measure how rainfall relates to stormwater discharge into estuaries.

Stay in touch

The NERRS Science Collaborative is committed to sharing information about the projects we fund in the most effective way we can. Updates about this project will be communicated through nerrs.noaa.gov, webinars, conferences, and meetings. If you would like to stay in touch with this project, contact our program coordinator, Cindy Tufts: cindy.tufts@unh.edu

For information about the applied science, contact Denise Sanger, manager, Marine Research Institute, South Carolina Department of Natural Resources: 843.953.9074 or SangerD@dnr.sc.gov

For information about the collaborative aspect of this project, contact April Turner, coastal communities specialist, South Carolina Sea Grant Consortium: 843.953.2078 or April.Turner@scseagrant.org

What's happening?

A team led by the ACE Basin National Estuarine Research Reserve (NERR) has received $276,624 to work with Beaufort County, South Carolina, and its partners to address the stormwater runoff that threatens local estuarine and coastal environments. The team is using a Joint Fact Finding (JFF) approach to work with a range of stakeholders to identify coastal watersheds that are sensitive to stormwater discharge and select those places in need of most protection.

Why this project?

Development, and the impervious surfaces that it creates, increases the volume of runoff that flows into estuaries and coastal waters, where its biological and chemical pollutants can threaten important natural resources. Additionally, increased stormwater flowing into marshes can change the salinity of the water, which may influence the survival of commercially and recreationally important finfish, crustaceans, and shellfish.

Beaufort County has designated the improvement of stormwater management as a high priority. In 2012, the County, South Carolina Department of Natural Resources (SCDNR), the University of South Carolina at Beaufort (USCB), and the town of Bluffton developed a five-year cooperative agreement to identify waters that would be sensitive to increased stormwater runoff. County Council appointed representatives of each legal jurisdiction comprise the Stormwater Management Utility Board, which focuses on stormwater discharge issues.

This project is building on the history of ongoing collaboration among key participant organizations to help Beaufort County reduce stormwater volume and to control its negative impacts.

While the County has passed ordinances requiring stormwater retention and undertaken projects to meet that goal, they need additional science to go further. This project is helping the County meet the need for rigorous scientific data to identify those coastal watersheds that are most sensitive to increases in stormwater discharge.

In partnership with SCDNR and USCB, they are working to provide water quality and rainfall data and modeling that decision makers within Beaufort County need to inform policy and management decisions in the future.

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National Estuarine Research Reserve System Science Collaborative
ACE Basin National Estuarine Research Reserve
Sea Grant S.C. Sea Grant Consortium
Hollings Marine Laboratory
DNR
Beaufort County South Carolina 1769
University of South Carolina Beaufort
NOAA
University of New Hampshire

Researchers are using data sondes to record salinity, depth, and water temperature at selected watersheds. They will compare this data to that collected by rain gauges to assess the watersheds' sensitivities to stormwater discharge.

About the funder

The NERRS Science Collaborative puts Reserve-based science to work for coastal communities coping with the impacts of land use change, stormwater, non-point source pollution, and habitat degradation all in the context of a changing climate. Our threefold approach to connecting science to decision making includes:

• Using a competitive RFP, we fund projects that incorporate collaboration and applied science to address coastal management problems identified as priorities for Reserves and their communities.

• Transfer of knowledge: Through our transfer program, the science we fund is shared throughout the NERRS and the communities they serve.

• Graduate education: Through TIDES (Training for the Integration of Decision Making and Ecosystem Science), a non-thesis Master's degree program hosted by the University of New Hampshire, we train the next generation of professionals to link science to coastal decision making.

The program operates by a cooperative agreement between the University of New Hampshire (UNH) and the National Oceanic and Atmospheric Administration.

Learn more at....

nerrs.noaa.gov/ScienceCollaborative.aspx

How will this project work?

The project team will work with Beaufort County officials and local citizens, the SCDNR, and USCB to address three barriers to implementation of the county's stormwater volume control plan: lack of credible, unbiased scientific data; internal capacity to conduct necessary studies of volume sensitive waters; and length of time to obtain the desired data. In addressing these barriers, they will use the principles of Joint Fact Finding to:

- Engage engineers and professional staff of the Watershed Advisory Committee for technical advice and assistance;
- Ensure that members of the County's Stormwater Management Utility Board thoroughly understand the progress of the research;
- Enable community groups to understand and disseminate the results and analyses generated by this project.

The project team is measuring rainfall and corresponding salinity in five watersheds selected by the county. They will study how these watersheds respond seasonally and tidally to rain events. To this end, they are simultaneously deploying instruments that continuously record salinity, depth, and water temperature in the selected watersheds. They also will install rain gauges in each location.

They will use data collected by these instruments to develop models that compare the magnitude and timing of rainfall to the discharge of stormwater and reduction of salinities along the estuary. These models will enable simulations of how the use of different stormwater manangement techniques or changing weather patterns would alter discharge.

The Watershed Advisory Committee will vet all of the results, analyses, and conclusions generated through this project.

The team will then present the results to the Stormwater Management Utility Board, which will use this information to assess related management and policy decisions for the selected watersheds. The Board will share results with other stormwater managers and environmental action groups throughout the county.